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ABSTRACT

The utilization of the third grade achievement data reported by the California Assessment Program (CAP) to schools was studied. All elementary school principals in California were surveyed in 1979 regarding the uses they made of the report. Over 70 percent used their score reports to compare results across years looking for trends. Other common uses included: closer examination of curriculum; revision of existing programs; development of instructional strategies to correct problem areas; to call attention to new problem areas; and reflecting to the community the favorability of programs. A factor analysis of these responses distinguished four types of uses: curriculum review; program evaluation; monitoring of achievement; and textbook review. Monitoring and curriculum review had strong positive correlations with achievement; textbook review had the weakest correlation with achievement. When achievement was regressed on school background factors and the four use factor variables, monitoring had the strongest positive weight, and curriculum review had the next largest. A cluster analysis indicated that above average use of the score reports was associated with above average achievement. (Author/BW)

Use of Evaluation Data and School Achievement

by

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Running head: Evaluation and Achievement

AUTHOR'S NOTE

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ABSTRACT

This paper reports on a study of the utilization of third grade achievement data reported by the California Assessment Program (CAP) to schools. All elementary school principals in California were surveyed in 1979 regarding the uses they made of the report. Results were factor analyzed to examine interpretable dimensions of use. Achievment scores were regressed on factor scores and school demographic background factors to reveal that some uses of data had a significant positive effect on achievement. A cluster analysis of the factor scores demonstrated that there are some distinct types of schools which tend to use CAP report data more than others.

USE OF EVALUATION DATA AND SCHOOL ACHIEVEMENT

The California Assessment Program (CAP) tests yearly over 280,000 third grade students in over 4,500 elementary schools. Detailed reports, including achievement data and school demographic information, are sent to the schools each year. Two questions of interest are the extent to which schools make use of this information and whether such use has beneficial effects on achievement. To begin to address these questions all elementary school principals were asked in 1979 to complete a survey describing the uses they made of CAP data. Their responses were analyzed along with school achievement and demographic data. The first objective of this study was to determine whether there were any interpretable categories or dimensions of use that could be ascribed to the schools. The second objective was to ascertain the effects of use on achievement after taking school background factors, for instance socioeconomic status, into account. A final objective was to ascertain whether schools could be clustered into types based on the ways in which they used CAP data.

School testing and evaluation are expensive, time consuming, and often controversial activities. As a result, there is a concern that evaluations find appropriate use in deci-

sion making, and that there are beneficial and measurable effects of such use. These concerns have stimulated the growth of a literature devoted to the subject e.g., Alkin, Daillak & White (1979), Davis & Salasin (1975), Rossi (1966), Patton (1975), and Worthen & Sanders (1973).

Alkin Daillak & White argue that a distinguishing feature of evaluation is that it should provide information for decision making. Research studies, by contrast, add to scientific knowledge. They are not oriented toward policy formulation. One pessimistic school of thought holds that evaluations are in fact little used and have minimal impact. An alternative perspective is that under the appropriate conditions evaluations are used and do have an effect. The point then is to study the conditions under which evaluations are used, the different types of use, and the different impacts of use. To adequately study evaluation it is necessary to allow a definition of use which covers many different facets. This paper adopts such a multifaceted definition, and recognizing that school achievement is affected by demographic variables, takes such variables into account in the study of the effects of use.

Method

Materials. The 1979 survey of school principals was conducted simultaneously with the administration of the CAP third grade Reading Test. The survey consisted of a check-

list of eighteen possible uses of CAP data. These are listed in Table 1. Principals were instructed to check as many of the uses as seemed appropriate for their school. The Reading Test consisted of 250 items distributed among ten unique forms of 25 items each. The test was designed to measure a wide range of reading skills, including word identification, vocabulary, comprehension and study locational.

Insert table 1 about here.

Procedure. All principals of California elementary schools were asked in April, 1979 to complete the survey. The Reading Test was administered in the Spring of 1979 to all Calfornia third grade students under standardized conditions by school personnel. The test documents were returned with the completed surveys for processing.

Analysis. The proportion of principals indicating each use were obtained by aggregating the school level responses. The data were factor analyzed by the principal axis method; factors with eigenvalues greater than 1.0 were retained and varimax rotated. Factor scores were obtained for each school, and these were used in a weighted multiple regression with other background factors, using the Reading Test scores as a criterion. The weighting factor for the regression was the number of students tested. Finally, the factor

scores were cluster analyzed using the SAS (1981) FASTCLUS program. For each cluster average Reading test scores were examined along with the background factors.

Background factors used in the multiple regression included an index of socioeconomic status (SES), the percent Aid to Families with Dependent Children (AFDC), the percent of limited or non-English speaking students (LES/NES) and an Entry Level Test (ELT) score for the school. The ELT score is the mean test score obtained in the fall of same school year by all first grade students. The ELT is designed to measure readiness skills. The SES index is calculated from data filled in by teachers on the back of each student's test. Teachers classified the usual occupation of the principal breadwinner in one of five categories: unknown, unskilled employee, skilled and semiskilled employee, semiprofessional, and executive or professional. The responses were coded so that SES varied between 1.0 and 3.0 . The school SES value was the mean of the pupil values. The percent AFDC is the percentage of pupils in the school whose families received aid from the AFDC program. The percent LES/NES is the percentage of third grade students who were designated according to state adopted criteria as either limited or non-English speaking.

Results

Examination of the means in Table 2 reveals that a high of 71 percent of those surveyed used their score reports to compare results across years looking for trends. Other uses indicated by more than half of the sample included: closer examination of curriculum; revision of existing programs; development of instructional strategies to correct problem areas; call attention to new problem areas, and; reflecting to the community the favorability of programs. Least indicated uses related to review of textbooks.

Insert tables 2 and 3 about here.

Principal components factor analysis resulted in four factors with eigenvalues greater than one. These were varimax rotated and the resulting factor pattern matrix is shown in Table 3. All four factors can be interpreted. Variables which loaded on factor one involved the use of data to review curriculum. These variables were: Call attention to a problem area not previously noted; develop new instructional materials; develop or focus teacher inservice activities; articulate curriculum and activities within and across grades; change the amount of time devoted to teaching various skills; and develop instructional strategies to correct problem areas. Variables loading on factor two involved the

use of data in program evaluation. These variables were: Plan a new program for the school; revise existing programs; and evaluate new programs already implemented. Variables which loaded on factor three related to the monitoring and description of achievement. These variables included: verify findings from own testing program; compare results across grade levels; and compare results across years, looking for trends. The variable, "reflect to the community the favorability of our programs", loaded heavily on factor three. Presumably this would involve the release of the data analyses to the press. Finally, the two variables loading on factor four relate to the review of textbooks.

Table 4 contains the means and standard deviations of variables used in the multiple regression, and Table 5 contains the associated correlation matrix. Results of the multiple regression are shown in Table 6. The value of R-square is .74 . Variables with negative regression weights, in order of size, are percent AFDC, factor two, and percent LES/NES. Of the four factors the one with the greatest potential effect on achievement is factor three (monitoring).

Insert tables 4, 5 and 6 about here.

Ten clusters were produced by the SAS procedure FASTCLUS. To facilitate comparisons, the Reading Test scores, factor scores and background factors were standardized with a mean of 25 and a standard deviation of 5. Means of these variables were calculated for each cluster (shown in Table 7) and plotted, resulting in a cluster profile. Cluster three, with 676 schools, shown in Figure 1, had the highest average achievement. The other use variables are below average for this cluster, and SES is above average. Cluster seven, with 243 schools, shown in Figure 2, had the highest average value of of factor three (monitoring). The use variables in this cluster are all above average, and all background factors are about average. In both cases here high values for monitoring are associated with higher achievement.

Insert table 7 and figures 1 and 2 about here.

Cluster four, with 103 schools, shown in Figure 3, had the lowest average achievment. Although other use variables are above average, factor three (monitoring) is below average, and SES is below average. Cluster five, with 845 schools, shown in Figure 4, had the lowest average value for monitoring. Achievement is below average in this this cluster, as is SES. In both of these clusters below average achievement is associated with with below average monitoring.

Insert figures 3 and 4 about here.

Discussion

The first question posed at the beginning of this study was whether CAP report data were used by school personnel. The answer, based on examination of Table 2, is that some features of the report were used by a solid majority of the principals surveyed. In fact, two of the uses indicated by more than one half of the respondents loaded heavily on factor three (monitoring), which proved to be that aspect of use having the strongest influence on achievement. These were: Comparing results across years looking for trends; and reflecting to the community the favorability of programs. Possibly, what is at issue in both cases is whether scores are up, or down, and how to present this to relevant audiences. Different patterns of use were exhibited by different types of school. The schools in cluster four had a high score for factor four (textbooks), but a low score for factor three (monitoring). This was associated with low achievement. However, textbook review may be an important activity in its own right, regardless of its relationship to achievement. By contrast, in cluster seven, the schools are above average on all use variables, and display above average achievement.

The second question addressed by this study was the extent to which the use of CAP reports resulted in better achievement. From the results of a factor analysis it was found that four types of use could be distinguished: curriculum review; program evaluation; monitoring of achievement; and textbook review. These four types correlated differently with achievement. The strongest positive correlations were for monitoring and curriculum review. The weakest was with textbook review. However, raw correlations do not reflect the influences of other background variables, such as SES and LES/NES. To address this issue achievement was regressed on school background factors and the four use factor variables. Again, of the four use variables, monitoring had the strongest positive weight, and curriculum review had the next largest. Compared with the nearly overwhelming influence of SES on achievement, these weights are modest. But, they are reliable and they are larger in magnitude than the weights for percent AFDC or percent LES/NES. The weight for program evaluation use was negative, but may not have been significantly greater than zero, even in this relatively large sample.

The results of the multiple regression were confirmed by the cluster analysis, which had been done solely on the basis of the four use factor variables. In the clusters above average use, especially for monitoring purposes, was associated with above average achievement, and below average

use was associated with below average achievement. The cluster analysis went beyond the regression in confirming that different types of schools displayed different patterns of use.

Conclusions

A causal interpretation of these results would certainly be premature. The data do support the assertion that schools use CAP reports for various purposes, and that some of these uses are associated with higher achievement. This result is of interest for several reasons. First, there is little reason to expect a priori that use of report data would be associated with improved achievement. There are more obvious relationships of that nature; e.g. with SES (confirmed here), with time on task; with curriculum, with school climate, etc. Furthermore, the variables just mentioned might well overpower and mask the effects of use. So, that the data did support the hypothesis is a bit surprising. Important questions remain, however, regarding how use interacts with the other variables mentioned.

An additional point is that improved achievement is only one of many goals for a school, and only one of many possible reasons for using achievement data. A school is an institution and evaluation data can serve in policy formation in multifarious direct and indirect ways. Presumably school boards act not only on the basis of objective data,

but also to meet the needs of constituencies. The same report can "cast a different shadow" depending on the perspective of those constituencies. "Objective data" can be interpreted differently, depending on one's point of view. Although there is potential for diviseness in such situations, there is also potential for constructive dialogue, in which the needs of the school as an institution and its various constituencies are met.

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Table 1

Use of the Grade 3 Survey of Basic Skills

1. Reflect to the community the favorability of our present programs.
2. Call attention to a problem area not previously noted.
3. Confirm suspicions about a problem area.
4. Verify findings from the district's or school's own testing program.
5. Compare results across grade levels.
6. Compare results across years, looking for trends.
7. Document needs for special funds or projects.
8. Examine our textbooks more closely.
9. Change our textbooks or other instructional materials.
10. Plan a new program for the school.
11. Revise existing programs.
12. Evaluate new programs already implemented.
13. Examine our curriculum more closely.
14. Develop new instructional materials.
15. Develop or focus teacher inservice activities.
16. Articulate curriculum and teacher activities within and across grade levels.
17. Change the amount of time devoted to teaching various skills.
18. Develop instructional strategies to correct problem areas.

TABLE 2

1979 SURVEY OF SCHOOL PRINCIPALS

MEANS AND STD DEVIATIONS

	USE1	USE2	USE3	USE4	USE5	USE6	USE7	USE8	USE9
MEAN	0.50859	0.54834	0.33192	0.37850	0.44931	0.71418	0.30064	0.14726	0.13032
STD DEV	0.49999	0.49772	0.47096	0.48507	0.49748	0.45185	0.45859	0.35441	0.33670

	USE10	USE11	USE12	USE13	USE14	USE15	USE16	USE17	USE18
MEAN	0.24418	0.58574	0.31710	0.59139	0.22277	0.49099	0.36039	0.27100	0.58410
STD DEV	0.42965	0.49265	0.46540	0.49163	0.41615	0.49998	0.48017	0.44453	0.49293

NUMBER OF OBSERVATIONS= 4251

CORPELATION MATRIX

	USE1	USE2	USE3	USE4	USE5	USE6	USE7	USE8	USE9
USE1	1.00000	0.07516	0.01937	0.11806	0.11030	0.10824	0.07299	0.10706	0.10936
USE2	0.07516	1.00000	0.23920	0.04261	0.10707	0.11533	0.07342	0.12504	0.13089
USE3	0.01937	0.23920	1.00000	0.13177	0.11452	0.07661	0.12616	0.15960	0.19159
USE4	0.11806	0.04261	0.13177	1.00000	0.11025	0.10400	0.12511	0.14653	0.13155
USE5	0.11030	0.10707	0.11452	0.11025	1.00000	0.15063	0.07610	0.14911	0.14621
USE6	0.10824	0.11533	0.07661	0.10400	0.15063	1.00000	0.02529	0.09216	0.09023
USE7	0.07299	0.07342	0.12616	0.12511	0.07610	0.02529	1.00000	0.11988	0.13631
USE8	0.10706	0.12504	0.15960	0.14653	0.14911	0.09216	0.11988	1.00000	0.45435
USE9	0.10936	0.13089	0.19159	0.13155	0.14621	0.09023	0.13631	0.45435	1.00000
USE10	0.13811	0.10763	0.17729	0.10739	0.11077	0.06627	0.22802	0.18720	0.25817
USE11	0.09230	0.18389	0.19320	0.11868	0.10198	0.11382	0.17749	0.17832	0.20923
USE12	0.14301	0.12681	0.19169	0.16966	0.15605	0.10772	0.21359	0.21611	0.21371
USE13	0.09038	0.16488	0.15096	0.09615	0.12164	0.11178	0.06387	0.21578	0.18531
USE14	0.13499	0.16213	0.17248	0.13020	0.12673	0.07341	0.15325	0.23698	0.27134
USE15	0.13420	0.17550	0.16915	0.11067	0.12515	0.12029	0.18633	0.18912	0.19291
USE16	0.12432	0.16042	0.15971	0.13652	0.21341	0.12132	0.12761	0.22039	0.20571
USE17	0.07422	0.15028	0.17716	0.08181	0.12704	0.00699	0.05964	0.19768	0.22146
USE18	0.07559	0.18938	0.15269	0.07694	0.11358	0.08734	0.09735	0.14384	0.15653

TABLE 2

1979 SURVEY OF SCHOOL PRINCIPALS

CORRELATION MATRIX

	USE10	USE11	USE12	USE13	USE14	USE15	USE16	USE17	USE18
USE1	0.13811	0.09230	0.14301	0.09038	0.13499	0.13420	0.12432	0.07422	0.07559
USE2	0.18763	0.18389	0.12681	0.16488	0.16213	0.17550	0.16042	0.15028	0.18938
USE3	0.17729	0.19320	0.19169	0.15096	0.17248	0.16915	0.15971	0.17716	0.15208
USE4	0.10739	0.11868	0.16966	0.09615	0.13820	0.11067	0.13652	0.08181	0.07694
USE5	0.11077	0.10198	0.15605	0.12164	0.12673	0.12515	0.21341	0.12704	0.11358
USE6	0.06627	0.11382	0.10772	0.11178	0.07341	0.12029	0.12132	0.08699	0.08734
USE7	0.22802	0.17749	0.21359	0.06387	0.15325	0.18633	0.12761	0.05964	0.09735
USE8	0.18720	0.17832	0.21611	0.21578	0.23698	0.18912	0.22039	0.19768	0.14324
USE9	0.25817	0.20923	0.21371	0.18531	0.27134	0.19291	0.20571	0.22146	0.15653
USE10	1.00000	0.29013	0.29635	0.14162	0.21945	0.22060	0.19722	0.17211	0.16077
USE11	0.29013	1.00000	0.26212	0.21803	0.24709	0.27851	0.20156	0.16892	0.23796
USE12	0.29635	0.26212	1.00000	0.14171	0.23775	0.23986	0.25185	0.15320	0.21193
USE13	0.14162	0.21803	0.14171	1.00000	0.23570	0.22569	0.24319	0.17842	0.26853
USE14	0.21945	0.24709	0.23775	0.23570	1.00000	0.23870	0.23987	0.22814	0.25333
USE15	0.22060	0.27851	0.23986	0.22569	0.23870	1.00000	0.24196	0.18996	0.30359
USE16	0.19722	0.20156	0.25185	0.24319	0.23987	0.24196	1.00000	0.17509	0.24173
USE17	0.17211	0.16892	0.15320	0.17842	0.22814	0.18996	0.17509	1.00000	0.20522
USE18	0.16077	0.23796	0.21193	0.26853	0.25333	0.30359	0.24173	0.20522	1.00000

TABLE 3

1979 SURVEY OF SCHOOL PRINCIPALS

ROTATION METHOD: VARIMAX

ROTATED FACTOR PATTERN

	FACTOR1	FACTOR2	FACTOR3	FACTOR4
USE1	-0.02714	0.19960	0.55279	0.01968
USE2	0.57353	-0.00834	0.06624	0.00534
USE3	0.39509	0.19720	-0.02142	0.19327
USE4	-0.07729	0.27734	0.44253	0.16165
USE5	0.14672	-0.02603	0.56664	0.15905
USE6	0.20561	-0.10152	0.63148	-0.07687
USE7	-0.00505	0.70075	0.01739	0.00036
USE8	0.10209	0.09383	0.12864	0.77893
USE9	0.11578	0.17378	0.08057	0.77262
USE10	0.14892	0.61068	0.04591	0.20633
USE11	0.42939	0.45543	0.03061	0.06181
USE12	0.19404	0.55192	0.22910	0.13773
USE13	0.55014	-0.03208	0.12676	0.21025
USE14	0.37085	0.26098	0.07900	0.33660
USE15	0.49924	0.35181	0.13056	0.01694
USE16	0.38762	0.16666	0.32738	0.10933
USE17	0.41227	-0.00773	0.03235	0.37681
USE18	0.65353	0.14096	0.03303	0.00103

ORTHOGONAL TRANSFORMATION MATRIX

	1	2	3	4
1	0.64042	0.50055	0.35046	0.46529
2	-0.72239	0.64818	0.10943	0.21456
3	-0.23673	-0.47495	0.81843	0.22034
4	0.10942	0.32207	0.44202	-0.83001

VARIANCE EXPLAINED BY EACH FACTOR

FACTOR1	FACTOR2	FACTOR3	FACTOR4
2.265362	1.823300	1.453711	1.699136

TABLE 4

1979 SURVEY OF SCHOOL PRINCIPALS

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
FACTOR1	4410	-0.13180755	1.04860570	-581.2712927	-2.83948097	2.72921466
FACTOR2	4410	-0.04329970	0.96714900	-190.9516976	-2.41005076	3.13401224
FACTOR3	4410	-0.13289871	1.05111215	-586.0833093	-2.57916449	2.46938940
FACTOR4	4410	0.00852145	0.95520621	37.5795967	-1.58954734	3.84968057
RSS79	4357	254.59169153	48.40218004	1109256.0000000	45.00000000	465.00000000
SESVAL79	4349	2.16067832	0.42127378	9396.7900000	1.00000000	3.00000000
AFVAL79	4322	13.95388709	14.01865636	60308.7000000	0	97.90000000
LNVAL79	4363	6.95656658	12.01574543	30351.5000000	0	84.40000000
ELT79	4331	27.37708612	2.81016329	118570.1600000	12.56000000	34.50000000

TABLE 5

CORRELATION COEFFICIENTS / PROB > |R| UNDER H0:PHO=0 / NUMBER OF OBSERVATIONS

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	RSS79	SESVAL79	AFVAL79	LNVAL79	ELT79
FACTOR1	1.00000	0.06135	0.16579	-0.02575	0.02108	0.01186	-0.00570	-0.02628	0.00558
	0.0000	0.0001	0.0001	0.0873	0.1642	0.4344	0.7078	0.0826	0.7134
	4410	4410	4410	4410	4357	4349	4322	4363	4331
FACTOR2	0.06135	1.00000	0.06009	-0.00371	-0.10119	-0.07188	0.10343	0.06066	-0.08241
	0.0001	0.0000	0.0001	0.8054	0.0001	0.0001	0.0001	0.0001	0.0001
	4410	4410	4410	4410	4357	4349	4322	4363	4331
FACTOR3	0.16579	0.06009	1.00000	-0.01903	0.16033	0.15344	-0.11261	-0.09281	0.14209
	0.0001	0.0001	0.0000	0.2063	0.0001	0.0001	0.0001	0.0001	0.0001
	4410	4410	4410	4410	4357	4349	4322	4363	4331
FACTOR4	-0.02575	-0.00371	-0.01903	1.00000	0.01915	0.00532	-0.01784	0.00450	-0.00450
	0.0873	0.8054	0.2063	0.0000	0.2063	0.7257	0.2410	0.7511	0.7673
	4410	4410	4410	4410	4357	4349	4322	4363	4331
RSS79	0.02108	-0.10119	0.16033	0.01915	1.00000	0.70036	-0.60672	-0.54891	0.73297
	0.1642	0.0001	0.0001	0.2063	0.0000	0.0001	0.0001	0.0001	0.0001
	4357	4357	4357	4357	4357	4344	4317	4357	4327
SESVAL79	0.01186	-0.07188	0.15344	0.00532	0.70036	1.00000	-0.61357	-0.49005	0.66598
	0.4344	0.0001	0.0001	0.7257	0.0001	0.0000	0.0001	0.0001	0.0001
	4349	4349	4349	4349	4344	4349	4309	4349	4319
AFVAL79	-0.00570	0.10343	-0.11261	-0.01784	-0.60672	-0.61357	1.00000	0.25935	-0.52952
	0.7078	0.0001	0.0001	0.2410	0.0001	0.0001	0.0000	0.0001	0.0001
	4322	4322	4322	4322	4317	4309	4322	4322	4296

TABLE 5

1979 SURVEY OF SCHOOL PRINCIPALS

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	RSS79	SESVAL79	AFVAL79	LNVAL79	ELT79
LNVAL79	-0.02628	0.06066	-0.09281	0.00480	-0.54891	-0.49005	0.25935	1.00000	-0.68796
	0.0826	0.0001	0.0001	0.7511	0.0001	0.0001	0.0001	0.0000	0.0001
	4363	4363	4363	4363	4357	4349	4322	4363	4331
ELT79	0.00558	-0.08241	0.14209	-0.00450	0.73297	0.66598	-0.52952	-0.68796	1.00000
	0.7134	0.0001	0.0001	0.7673	0.0001	0.0001	0.0001	0.0001	0.0000
	4331	4331	4331	4331	4327	4319	4296	4331	4331

TABLE6

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RSS79
WEIGHT: NTEST

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	8	452181895.19815310	56522736.89976914	1556.15	0.0001	0.744560	74.8016
ERROR	4271	155132134.34319049	36322.20424800		STD DEV		RSS79 MEAN
CORRECTED TOTAL	4279	607314029.54134360			190.58305096		254.51355140

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE IV SS	F VALUE	PR > F
SESVAL79	1	360777714.56879293	9932.70	0.0001	1	18476992.59165242	508.70	0.0001
AFVAL79	1	27476940.67943857	756.48	0.0001	1	16269400.69633648	447.92	0.0001
LNVAL79	1	37162948.66217995	1023.15	0.0001	1	2248739.63599626	61.91	0.0001
ELT79	1	25804142.50188600	707.12	0.0001	1	25283214.99804433	696.08	0.0001
FACTOR1	1	314718.57968293	8.66	0.0033	1	212787.35096633	5.86	0.0155
FACTOR2	1	92625.39451804	2.55	0.1104	1	128478.99917955	3.54	0.0601
FACTOR3	1	597008.02369681	16.44	0.0001	1	594798.50851351	16.38	0.0001
FACTOR4	1	75796.78795740	2.09	0.1487	1	75796.78795740	2.09	0.1487

PARAMETER	ESTIMATE	T FOR H0: PARAMETER=0	PR > |T|	STD ERROR OF ESTIMATE
INTERCEPT	21.39794946	3.18	0.0015	6.72217912
SESVAL79	32.87967075	22.55	0.0001	1.45779990
AFVAL79	-0.75246933	-21.16	0.0001	0.03555405
LNVAL79	-0.34641230	-7.87	0.0001	0.04402606
ELT79	6.35016522	26.38	0.0001	0.24068030
FACTOR1	0.89691294	2.42	0.0155	0.37056421
FACTOR2	-0.73214362	-1.88	0.0601	0.38928378
FACTOR3	1.53213282	4.05	0.0001	0.37861476
FACTOR4	0.55428986	1.44	0.1487	0.38370516

= 24

TABLE 7

1979 SURVEY OF SCHOOL PRINCIPALS

CLUSTER=1

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	500	28.71430300	2.94196930	23.04983927	38.64203061	0.13156887	14357.151498	8.65518338	10.246
FACTOR2	500	26.34780296	3.77284367	17.49696787	38.63749736	0.16872670	13173.941481	14.23434933	14.319
FACTOR3	500	19.78324205	2.68400586	13.53276650	24.89407899	0.12003239	9891.621024	7.20388747	13.567
FACTOR4	500	22.93632124	2.31150994	17.39350276	29.71666736	0.10337387	11468.160622	5.34307819	10.078
RSS79	500	24.12793864	4.85870224	9.45328388	46.86724548	0.21728777	12063.969321	23.60698743	20.137
AFVAL79	500	25.94945953	5.62508477	19.97267763	55.02803273	0.25156144	12974.729765	31.64157869	21.677
LNVAL79	500	25.27613687	5.23335103	22.08967526	56.93877038	0.23404257	12638.068437	27.38796302	20.705
ELT79	500	24.14142249	5.00612929	-1.60280035	33.49753871	0.22388091	12070.571245	25.06133049	20.737
SESVAL79	500	24.00149550	4.72196215	11.12788342	35.03134811	0.21117257	12000.747751	22.29692658	19.674

CLUSTER=2

FACTOR1	95	20.86748159	3.11709260	12.08917271	27.46177540	0.31980695	1982.4107515	9.71626628	14.938
FACTOR2	95	22.83154670	3.38424922	16.16149764	30.49115664	0.34721664	2168.9969364	11.45314280	14.823
FACTOR3	95	25.20139621	4.29811902	15.53953461	33.39208095	0.44097771	2394.1326403	18.47382709	17.055
FACTOR4	95	37.54451195	3.86120040	30.90588444	45.10643929	0.39615080	3566.7206357	14.90886855	10.284
RSS79	95	24.12414244	5.40507079	9.14150087	38.86481481	0.55454856	2291.7935315	29.21479024	22.405
AFVAL79	95	25.18558125	5.16686996	19.97267763	48.83119709	0.53010967	2392.6302185	26.69654516	20.515
LNVAL79	95	25.19853323	5.95640396	22.08967526	52.00216387	0.61111415	2393.8606571	35.47874816	23.638
ELT79	95	24.36960007	5.77403807	5.38135919	33.69503423	0.59240381	2315.1120069	33.33951568	23.694
SESVAL79	95	24.83471864	5.17206076	11.12788342	35.03134811	0.53064224	2359.2982708	26.75021255	20.826

CLUSTER=3

FACTOR1	676	20.57617935	2.59121796	13.65975763	27.29044491	0.09966223	13909.497241	6.71441051	12.593
FACTOR2	676	22.90612635	2.93128364	16.59831301	31.66886414	0.11274168	15484.541415	8.59242377	12.797
FACTOR3	676	29.57314321	2.87958321	24.68369983	37.37873670	0.11075320	19991.444813	8.29199944	9.737
FACTOR4	676	23.75342131	2.26906797	19.41666296	33.59331278	0.08727185	16057.312803	5.14866945	9.553
RSS79	676	26.04730188	4.90428268	10.80434361	43.12504932	0.18862626	17607.976072	24.05190860	18.828
AFVAL79	676	24.31275370	4.64527834	19.97267763	50.99288395	0.17866455	16435.421502	21.57861085	19.106
LNVAL79	676	24.46893118	4.53720006	22.08967526	55.13983750	0.17450769	16540.997475	20.58618443	18.543
ELT79	676	25.97129793	4.59476500	6.97927744	37.78857761	0.17672173	17556.597401	21.11186542	17.692
SESVAL79	676	25.86779995	4.98260131	11.12788342	35.03134811	0.19163851	17486.632768	24.82631586	19.262

CLUSTER=4

FACTOR1	103	26.02348768	3.38879535	18.98192299	33.73016842	0.33390793	2680.4192306	11.48393392	13.022
FACTOR2	103	31.01415692	3.43288610	22.33049759	37.75089969	0.33825232	3194.4581631	11.78470696	11.069
FACTOR3	103	20.64351620	3.33082359	13.36344066	26.37546943	0.32819500	2126.2821690	11.09438578	16.135
FACTOR4	103	34.68073883	4.08007229	27.94765887	43.04416341	0.40202147	3572.1161000	16.64698992	11.765
RSS79	103	23.33918963	5.13731791	3.21762361	38.86481481	0.50619497	2403.9365322	26.39203531	22.012
AFVAL79	103	26.85568946	5.48800637	19.97267763	45.94894796	0.54082816	2766.1360146	30.12699542	20.438
LNVAL79	103	26.48902377	6.29698492	22.08967526	52.46235600	0.62046036	2728.3694487	39.65201913	23.772
ELT79	103	23.20944037	4.93134445	8.14629638	32.59903183	0.48589901	2390.5723581	24.31815807	21.247
SESVAL79	103	23.29343728	4.82737892	11.12788342	35.03134811	0.47565578	2399.2240394	23.30358728	20.724

TABLE 7

1979 SURVEY OF SCHOOL PRINCIPALS

CLUSTER=5

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	845	19.85171398	2.36055786	15.05041930	26.62362129	0.08120566	16774.698315	5.57223339	11.891
FACTOR2	845	22.93162512	2.11552637	17.74109541	30.61865730	0.07277632	19377.223225	4.47545181	9.225
FACTOR3	845	19.59941551	2.23210867	15.28488478	25.10790116	0.07678687	16561.506105	4.98230910	11.389
FACTOR4	845	25.29116456	1.53121787	21.21227666	34.58281334	0.05267550	21371.034053	2.34462817	6.054
RSS79	845	24.48688995	5.31194042	8.31007950	44.16512603	0.18273631	20691.422009	28.21671106	21.693
AFVAL79	845	25.19640691	5.11739801	19.97267763	52.57012097	0.17604384	21290.963841	26.18776235	20.310
LNVAL79	845	25.31462390	5.55837807	22.08967526	55.13983750	0.19121402	21390.857194	30.89556680	21.957
ELT79	845	24.65775014	5.28452173	3.71162439	37.48335727	0.18179307	20835.798868	27.92616908	21.431
SESVAL79	845	24.46381370	5.32765481	11.12788342	35.03134811	0.18327690	20671.922578	28.38390573	21.778

CLUSTER=6

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	354	21.51830633	3.06923248	13.77854082	29.11329683	0.16312787	7617.480440	9.42018801	14.263
FACTOR2	354	32.69232981	3.32163009	26.45961853	41.42617607	0.17654265	11573.084754	11.03322648	10.160
FACTOR3	354	24.28191024	3.56418012	14.69261434	35.08636352	0.18943404	8595.796226	12.70337992	14.678
FACTOR4	354	22.38535725	2.31361729	17.12321929	30.97892978	0.12296737	7924.416466	5.35282496	10.335
RSS79	354	23.50224263	5.15372252	10.38863292	39.80016385	0.27391726	8319.793891	26.56085581	21.929
AFVAL79	354	26.01498872	5.78518199	19.97267763	55.24420142	0.30747895	9209.306007	33.46833065	22.238
LNVAL79	354	26.00635431	5.76751500	22.08967526	54.72143101	0.30653996	9206.249426	33.26422923	22.177
ELT79	354	23.67306678	5.75340717	3.69367025	33.74889664	0.30579014	8380.265640	33.10169404	24.304
SESVAL79	354	23.90518719	5.06773253	11.72547004	34.91183078	0.26934695	8462.436264	25.68191301	21.199

CLUSTER=7

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	243	28.96430943	2.71036048	19.01993473	34.65839299	0.17386971	7038.3271907	7.34605394	9.358
FACTOR2	243	30.63974094	3.63237939	21.12654117	36.65214356	0.23301725	7443.2700489	13.19418007	11.859
FACTOR3	243	30.29408203	2.12154281	24.39346925	34.85841319	0.13609703	7361.4619333	4.50094387	7.003
FACTOR4	243	36.27218852	4.01179029	28.57760915	42.72044508	0.25735647	8814.1418112	16.09446133	11.060
RSS79	243	25.60252844	4.89071153	11.53183730	37.72161042	0.31373929	6221.4144098	23.91905929	19.102
AFVAL79	243	24.73256314	4.76905744	19.97267763	48.43488784	0.30593518	6010.0128427	22.74390885	19.283
LNVAL79	243	25.03514003	4.82323449	22.08967526	54.51230277	0.30941064	6083.5390269	23.26359099	19.266
ELT79	243	25.06613173	5.00768986	3.11913785	32.52801528	0.32124345	6091.0700103	25.07695777	19.978
SESVAL79	243	25.39625283	4.71814525	12.68160862	35.03134811	0.30266916	6171.2894381	22.26089459	18.578

CLUSTER=8

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	561	28.95966226	2.75206072	22.99452709	36.23032512	0.11619209	16246.370527	7.57383819	9.503
FACTOR2	561	29.51313590	3.29223862	23.23990484	38.38231637	0.13899842	16556.869239	10.83883513	11.155
FACTOR3	561	28.82418090	3.01412599	22.25242366	35.79220119	0.12725650	16170.365485	9.08495550	10.457
FACTOR4	561	21.36402669	2.55300576	16.63495389	29.10781930	0.10778799	11985.218975	6.51783944	11.950
RSS79	561	25.32734029	4.64929630	10.38863292	39.17659782	0.19629344	14208.637905	21.61595605	18.357
AFVAL79	561	24.93261757	4.84039254	19.97267763	50.59657469	0.20436153	13987.198456	23.42939994	19.414
LNVAL79	561	24.49240294	4.02417334	22.08967526	50.16139534	0.16990073	13740.238051	16.19397110	16.430
ELT79	561	25.62095038	4.29049779	8.07447983	35.22113592	0.18114496	14373.353163	18.40837126	16.746
SESVAL79	561	25.43028209	4.79231373	12.32305665	35.03134811	0.20233164	14266.388251	22.96627090	18.845

TABLE 7

1979 SURVEY OF SCHOOL PRINCIPALS

CLUSTER=9

VARIABLE	#	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
FACTOR1	###	28.55490896	3.37285186	22.31306471	36.95130729	0.22096287	6653.2937885	11.37612965	11.812
FACTOR2	###	20.62780595	2.90202714	12.76428933	27.15714060	0.19011812	4806.2787855	8.42176152	14.069
FACTOR3	###	25.33572915	3.76431416	15.37626026	34.33353022	0.24660842	5903.2248928	14.17006109	14.858
FACTOR4	###	31.80418032	3.26705360	26.08524867	44.21949222	0.21403180	7410.3740148	10.67363920	10.272
RSS79	###	25.85137172	4.22751181	14.23395675	39.17659782	0.27695351	6023.3696106	17.87185611	16.353
AFVAL79	###	24.05779501	4.15763983	19.97267763	46.95773516	0.27237604	5605.4662373	17.28596896	17.282
LNVAL79	###	24.37080720	4.53802327	22.08967526	53.13172637	0.29729579	5678.3980787	20.59365523	18.621
ELT79	###	25.53702987	4.38746334	9.47490257	35.81362247	0.28743228	5950.1279608	19.24983460	17.181
SESVAL79	###	25.70646692	4.55511447	11.12788342	35.03134811	0.29841547	5989.6067933	20.74906779	17.720

CLUSTER=10

FACTOR1	###	28.73793877	3.02675480	23.13112422	38.52323942	0.10701194	22990.351017	9.16124460	10.532
FACTOR2	###	20.58916994	2.34645515	13.99325860	25.67755814	0.08295972	16471.335951	5.50505177	11.397
FACTOR3	###	26.56770589	3.25633818	20.25621658	35.70301222	0.11512894	21254.164712	10.60373836	12.257
FACTOR4	###	22.60062065	1.98080161	18.26878509	28.67689486	0.07003191	18080.496520	3.92357503	8.764
RSS79	###	25.52210840	4.81325338	9.97292224	41.25515124	0.17017421	20418.686718	23.16740806	18.859
AFVAL79	###	24.47266889	4.44148908	19.97267763	53.47882382	0.15703035	19578.135116	19.72602529	18.149
LNVAL79	###	24.81177776	4.58823521	22.08967526	57.39896251	0.16221861	19949.422206	21.05190233	18.492
ELT79	###	25.35816418	4.91130711	-0.75895588	34.91591558	0.17364093	20286.531347	24.12093754	19.368
SESVAL79	###	25.55306731	4.86171833	11.04498736	35.03134811	0.17188770	20442.453846	23.63630516	19.026

FIGURE 1

1979 SURVEY OF SCHOOL PRINCIPALS
CLUSTER=3

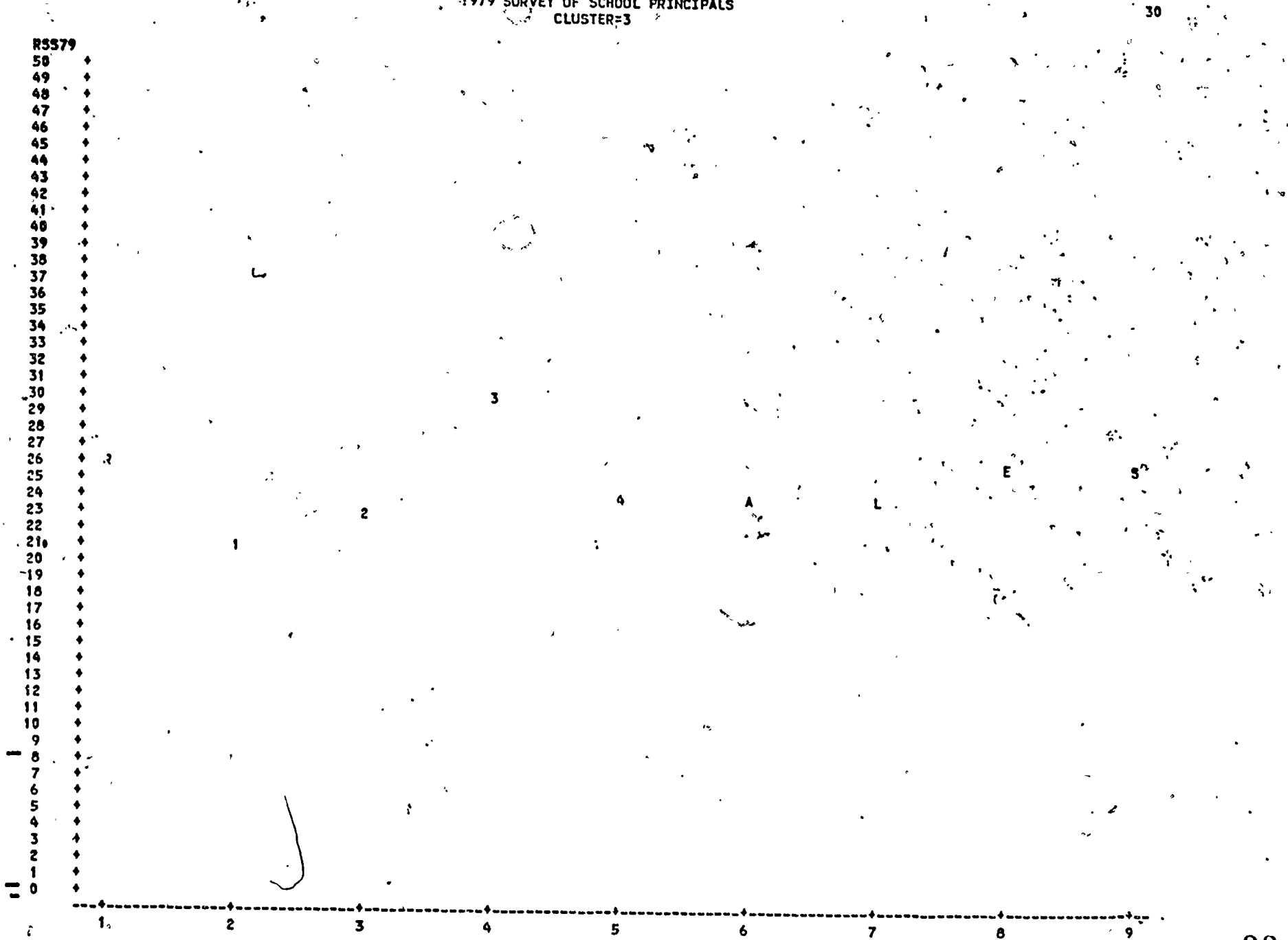

FIGURE 2

1979 SURVEY OF SCHOOL PRINCIPALS
CLUSTER=7

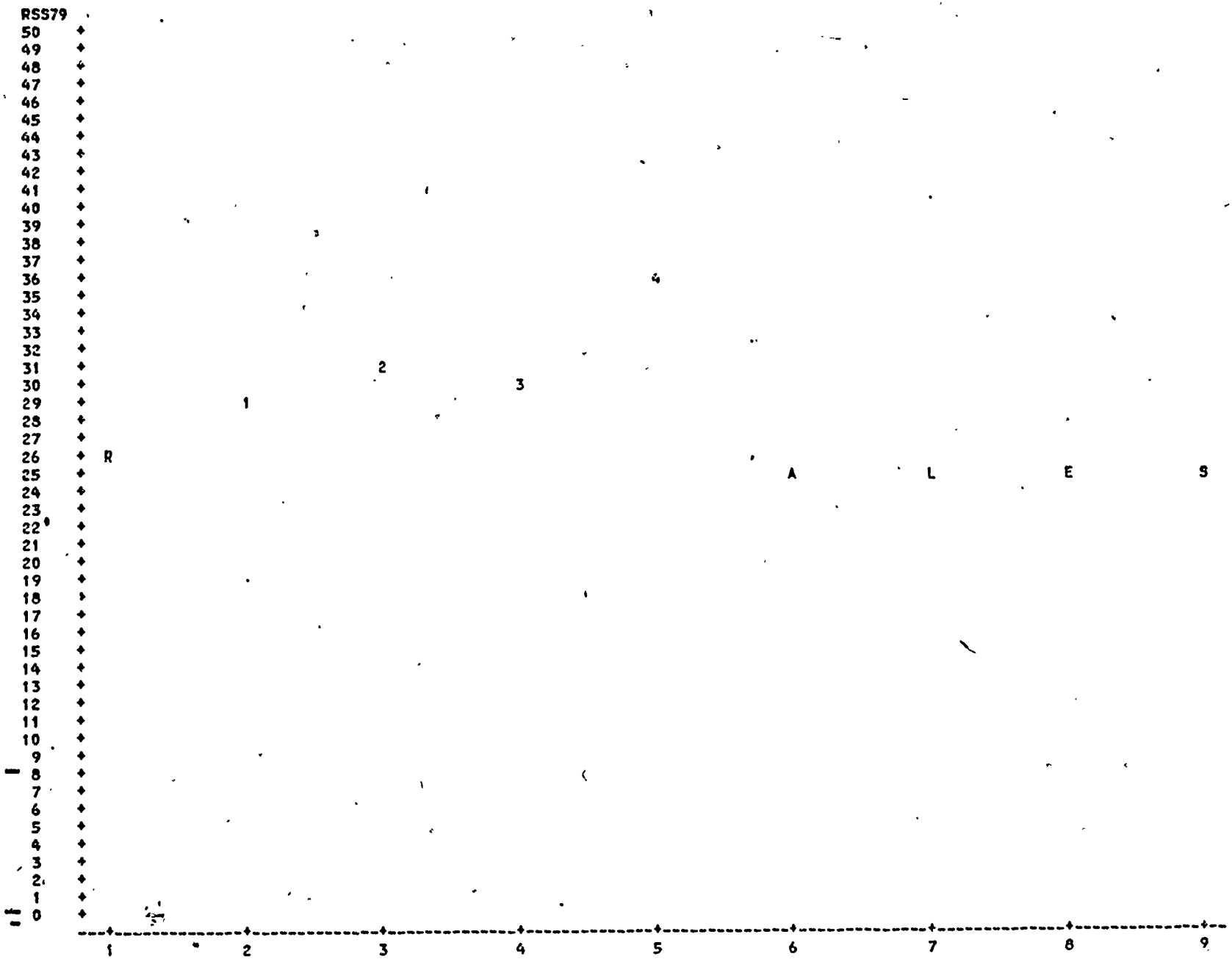

FIGURE 3

1979 SURVEY OF SCHOOL PRINCIPALS
CLUSTER=4

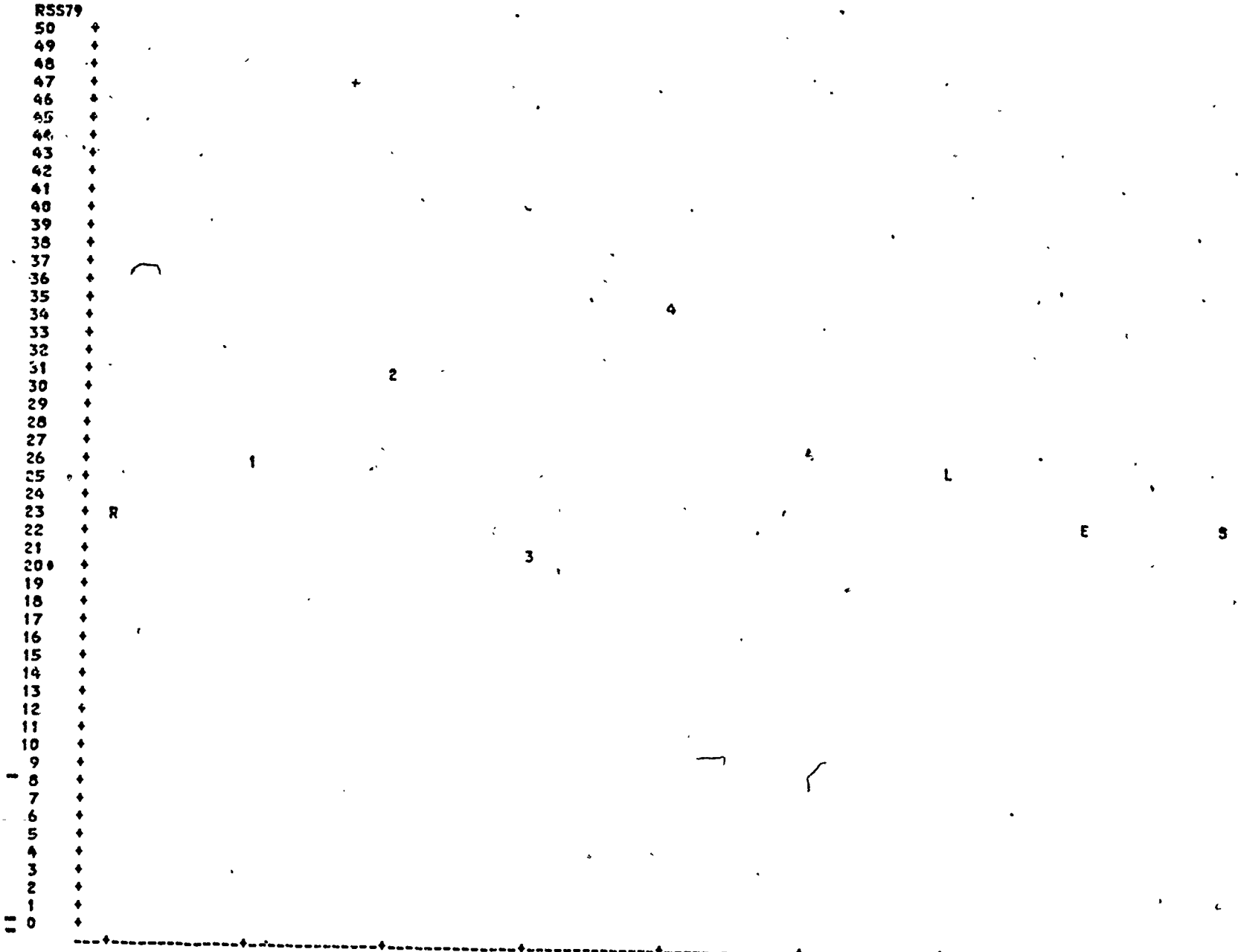

FIGURE 4

1979 SURVEY OF SCHOOL PRINCIPALS
CLUSTER=5